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Abstract

In a context with strong rhetorical support for breastfeeding in the health system, yet extremely low rates of breastfeeding after hospital discharge, UK women's decisions about infant feeding reflect the reality of competing priorities in their lives, including obtaining adequate sleep. Popular wisdom in the UK tightly links breastfeeding and inadequate night-time sleep. Mothers are advised by peers and family to introduce formula or solid foods to infants to promote longer sleep. The first objective of this study was to investigate women's understandings of the nature of infant sleep and their perceptions of links between infant feeding method and sleep. The second was to explore how these perceptions influence infant feeding and sleep practices in the first year. Underpinning our work is the understanding that infant care choices result from trade-offs by which mothers strive to balance infant- and self-care. We conducted seven focus groups with mothers of infants in two regions of the UK. Verbatim transcripts were thematically coded and emergent themes were identified. We found clearly diverging narratives between breastfeeding and formula-feeding mothers. Breastfeeding mothers viewed the fragmentary nature of infant sleep as natural, while mothers who were formula feeding felt this was a problem to be fixed. The strategies and approaches used to promote infant and maternal sleep in each group were aligned with this underlying perception of how infant sleep works. Maternal perceptions of the nature of infant sleep and its relation to infant feeding method impact infant care practices in the first year of life.

Significance

Parents of infants under a year of age desire to obtain adequate sleep for themselves and their infants. Infant feeding and sleep are tightly connected in popular perception, yet little research has directly explored women's experiences of infant feeding and sleep. This study reveals that a divergence of perceptions of infant sleep and feeding between feeding groups underlies the use of different strategies for night-time sleep. Formula feeding mothers valued a 'societally normative' approach that prioritised a return to their pre-baby routines. Breastfeeding mothers valued a 'biologically natural' approach to infant care, taking cues from the infant's biological needs.

Key words

infant feeding; infant sleep; maternal sleep; qualitative; United Kingdom;

Introduction

Against a contradictory backdrop of strong support for breastfeeding from the health system and extremely low exclusive breastfeeding rates, UK women's decisions about infant feeding reflect the competing priorities in their lives (Hoddinott, Craig, Britten, & McInnes, 2012; Tully & Ball, 2013). Achieving adequate sleep is one such priority. Infant night-waking is a major source of concern for new parents (Sadeh, Mindell, & Rivera, 2011). In the early months of life, parental sleep patterns are altered by the demands of caring for an infant whose sleep bouts occur throughout the 24-hour day in 2-3 hour stretches (Galland, Taylor, Elder, & Herbison, 2012), while adult sleep is usually consolidated into one longer, overnight period (Rosenwasser, 2009). This "changed sleep environment" (Kennedy, Gardiner, Gay, & Lee, 2007; p. 118) may result in tiredness and fatigue, decreasing new parents' capacity to accomplish daily tasks, interfering with their sense of well-being (Kurth et al., 2010) and potentially contributing to the development of postnatal depression (Goyal, Gay, & Lee, 2009).

UK popular wisdom closely links breastfeeding and sleep. The predominant view is that formula feeding promotes infant sleep while breastfed infants are too demanding, feed too frequently, and do not allow their mothers sufficient sleep through the night (Ball, Hooker, & Kelly, 1999; Brown & Harries, 2015). In both the UK and the US, many parents give night-waking as the reason they switched to formula (Douglas & Hill, 2013) and the idea that feeding the infant formula before bed will help the whole family to sleep better is widely accepted (Rosen, 2008). Mothers are advised by peers and family to introduce formula or solid foods to the infant diet in order to promote longer periods of nocturnal sleep (Clayton, Li, Perrine, & Scanlon, 2013; Crocetti, Dudas, & Krugman, 2004). This advice is at odds with WHO and National Health Service (NHS) recommendations to breastfeed exclusively to six months of

age (World Health Organization, 2001); although around one-third of women in the UK breastfeed to six months, only 1% do so exclusively (McAndrew et al., 2012).

However, research on the impact of feeding type on infant sleep has been inconclusive. Some studies suggest that breastfed babies sleep less, wake more or wake for longer than formula fed infants (Quillin & Glenn, 2004). In the last decade, an increasing number of studies have found that breastfeeding mothers and infants experience as much or more sleep than formula-feeding pairs, that breastfeeding mothers return to sleep more rapidly after overnight awakenings, and that hormonal mechanisms associated with breastfeeding may result in higher quality sleep (Doan, Gardiner, Gay, & Lee, 2007; Douglas & Hill, 2013; Montgomery-Downs, Clawges, & Santy, 2010).

Although many studies assume that parents make decisions about infant feeding with reference to its impact on infant and parental sleep, few have gathered original data on women's perceptions of this connection. In North East England, Ball found that 20% of women who switched from breastfeeding to formula said they had done so because they were not willing to tolerate the sleep disruption that they attributed to breastfeeding (Ball, 2003). In the US, mothers reported that they felt breastfeeding was associated with sleep disturbance (Kennedy et al., 2007) and that having the baby sleep through the night was a major benefit provided by formula (Marchand & Morrow, 1994). Two focus group studies, one of UK women (Redsell et al., 2010) and one of US women (Gross et al., 2010), both found that a need for feeding is parents' preferred explanation for night waking, so they may be less likely to recognise other contributing factors, such as developmental milestones or discomfort. In the UK study, mothers who introduced formula feeds reported being more comfortable with continued night-time crying once they felt confident that the infant was not hungry (Redsell et al., 2010).

To contextualise maternal decision-making about infant feeding, much more information on women's perceptions of how infant sleep works and the interconnections between sleep and feeding method is needed. We theorise that women's expectations and perceptions of infant feeding, coupled with their experiences of caring for an infant, influence their strategies and behaviours with regard to infant sleep. This study contributes an in-depth account of the views and experiences of women with infants under one year of age in the UK.

Methods

Seven focus groups of between four and eight participants were conducted with mothers of infants under a year old, in the North East and East Midlands regions of England. The study received ethical approval from the [BLINDED] research ethics committee at [BLINDED] and all participants gave written informed consent. The focus group discussions were semi-structured, and based on an interview guide (available as Electronic Supplementary Material). The topic was infant sleep, with a focus on perceptions and expectations of infant sleep, change in infant sleep through time, and infant sleep location. The interviewer did not raise feeding method as a potential influence on infant sleep, but, as we had expected, all groups spontaneously brought up feeding when asked about infant sleep.

Six of the focus groups were composed of members of pre-existing groups: one support group for young mothers aged 21 and under (YMSG); two breastfeeding support groups (BFSG); and three mother and baby groups (MBG). Participants for the seventh group were recruited among primary-school mothers, who also had an infant (PS). The focus groups are characterised in Table 1.

The sessions were digitally audio-recorded and transcribed verbatim. We took an experience-near approach to the analysis of the transcripts, which involves developing a detailed

understanding of participants' experiences through in-depth engagement with transcripts (Spencer, 2008). Transcripts were thematically coded separately by the authors. When each author had coded all transcripts, we met to discuss emerging themes. Differences in coding were resolved through discussion and with reference to the original transcripts, and a final coding system was created, which the lead author used to recode each transcript. Both of the authors are anthropologists experienced in qualitative and mixed-methods approaches. Both authors are also mothers with experience breastfeeding. We did not carry out post-analysis "member checking" as it is inconsistent with this interpretative approach to qualitative analysis (Lopez & Willis, 2004).

Results

Maternal understandings of the nature and functioning of infant sleep were divergent between mothers who were formula feeding and those who were breastfeeding, including mothers who had used a different feeding method with a previous infant (i.e. currently breastfeeding, previously formula fed or vice versa).

Infant sleep and feeding

All focus groups spontaneously identified feeding as a key factor associated with infant sleep. There was agreement across all groups that society perceives formula fed infants to be "better sleepers" and to permit "better sleep" for the mother. Participants considered "better" sleep to conform to the 8-hour night-time sleep expectation normative in the UK. Formula feeding mothers shared this societal view, summed up in the words of one participant: "*Formula and sleep is the key. Breastfeeding and sleep is not happening*" (YMSG-D). The inability to measure breast milk intake was felt to contribute to breastfed babies' lack of sleep. One young mother reported "*with breastfeeding you don't know how much they're actually having... if*

they're hungry they could wake up like 2 hours later or something" (YMSG-E). A currently formula-feeding mother looking back on her experience breastfeeding a previous child commented *"Aww, yeah, I knew I'd be up longer, 'cos obviously with the bottle you can see the milk go...but with breastfeeding you just don't know"* (PS-C).

Breastfeeding mothers reported that they were pressured to give their infant formula or other foods when the infant's sleep did not measure up: *"even from about four weeks... 'Put a rusk in the bottle, put a needle in the teat to make it wider'"* (BFSG1-D).

Two participants discussed this experience:

BFSG1-F: *"People expect babies to sleep 7 to 7, 24/7"*

BFSG1-D: *"And if they don't, you have to give them a bottle"*

BFSG1-F: *"Yes, I was told that last week. 'He's still not sleeping through the night? Put him on a bottle"*

Breastfeeding participants reported routinely receiving advice from people in their lives who associated formula-feeding with better infant sleep. However, the breastfeeding participants were not convinced by the argument for formula feeding.

BFSG2-A: *"I think it's quite an old fashioned notion that they need formula to sleep better and it goes back to that kind of regimented feeding...my mother-in-law and my auntie who are of that older generation and my boss they're like 'He's not sleeping through, you need a bottle. You need to give him formula.' Formula! Formula and solids...When he was 3 months old! [laughs] I was like 'No, I don't think he does'"*

Participants also cast doubt on the understanding that formula fed infants sleep better than breastfed infants. For example:

BFSG2-E: *"I've never formula fed, I've always breastfed. I've got family who have always formula fed and not breastfed and my babies sleep no different to how their babies sleep. The only difference is, they were concerned when their babies woke up after 3 hours. I wasn't."*

This illustrates the alternative outlook on sleep of breastfeeding participants. They saw infant sleep as inherently fragmentary, in contrast to their friends' and families' belief that infants

should sleep continuously through the night. As such, they did not feel that altering feeding method was an appropriate response to try to “normalise” their infant’s sleep.

Breastfeeding mothers who had previously formula fed also argued against the idea that their own sleep would be improved if they fed their infant formula: “[*Breastfed babies*] settle [*return to sleep*] a lot quicker than a bottle fed baby” (BFSG2-D). They used their prior experience to provide evidence comparing breastfed infant sleep with that of formula fed infants: “*I felt more sleep deprived when I bottle fed [my older daughter] than I do now*” (BFSG1-C).

Breastfeeding mothers shared an understanding that new mothers adjust to an attainable sleep pattern:

BFSG2-F: “*I think your body retrains, doesn’t it, when you have a baby...to not be in a routine as such, just to get good sleep where you can, even if it’s just an hour here or an hour there.*”

They felt that their body was then ‘set’ to operate optimally on that type of sleep. One reported:

BFSG2-B: “*I feel like I’ve had a really good night’s sleep, when I think I was up 3, 4 times last night but I just feel OK and I think if I had...a good 8-hours sleep I’d probably wake up feeling...really groggy.*”

Strategies for sleep

Different strategies for encouraging infants to sleep were used by breastfeeding and formula-feeding mothers. Among the latter, the establishment of a routine to encourage sleep was an ideal to be achieved as soon as possible, in order for parents to return to their pre-baby way of life: “*I’ve always had all of them in a routine. I believe that a baby fits round your routine, you don’t fit around theirs*” (PS-A). In contrast, breastfeeding mothers felt that a sleep routine was unnecessary and even incompatible with caring for a new baby: “[*Babies*] sleep when they need it and forget it. You’ve got to work round them...As often as she wakes is when she wakes. We’ll work around her because that’s what she needs” (BFSG2-C). Many of the

breastfeeding mothers felt that the infants would find their own sleep rhythm. *“I’ve kind of let them find their own kind of pattern...I’m not kind of completely free and easy but I do kind of let them find their own pattern”*(PS-D).

Breastfeeding mothers highlighted a change in “lifestyle” that goes with caring for an infant, driven by the needs of the infant. These mothers felt it was an intrinsic part of new parenthood.

MBG2-B: *“There is nothing wrong with [a lack of routine]. That is just what is supposed to be and if some people say ‘when we get back to normal’...this is normal for this stage of the baby. This is normal. You feed them when you need to...So this is normal for that stage of baby, so there is nothing to go back to.”*

Not surprisingly given these differences, breastfeeding and formula-feeding mothers had different strategies in response to infant night waking. In line with the goal of establishing a routine, formula-fed infants were expected to sleep through the night from very early infancy. Formula-feeding mothers used extinction (‘Cry-It-Out’) methods and other versions of sleep training as a main strategy to help attain this goal.

PS-A: *She got herself into a routine, come 7pm on a night. [B]ottle, Moses basket [bassinet], down. I wouldn’t let anyone pick her up whether they were near her or anything...I believe that because I stuck at that...I reaped some reward in a way because she does sometimes sleep through the night...But I think if I hadn’t of stuck to that routine and put her down...and let her cry it out then I think I’d be climbing the walls now...*

Breastfeeding mothers resisted the idea of leaving infants to cry as a way to improve their sleep. They set up a contrasting cue-driven style of care-giving that was in opposition to the Cry-It-Out approach.

BFSG2-C: *[With] Cry-It-Out, you’re teaching your baby that if you cry because you need something no-one’s going to come.*

BFSG2-B: *Yeah, I like my babies to know that if something’s wrong I’ll be there for them.*

The strategy for handling infant night-waking that breastfeeding mothers mentioned most commonly was for the infant and mother to sleep in proximity, usually sharing a bed, for night-time sleep. This was discussed as a natural outgrowth of breastfeeding:

MBG1-4: Because I breastfeed him, I just find it easier to put him in bed with me...I have put him in the cot right in the beginning but I find it a nightmare feeding him and picking him up and putting him back and so forth. And usually to tell you the truth when I feed him at night-time now, I don't really realise. It just naturally happens. I don't look at the time or get up or anything. He's just there, I put him on the breast and when he comes off, he comes off.

Women who had formula fed a previous infant who slept separately reported a benefit to their own night-time sleep from bed-sharing while breastfeeding the current infant.

BFSG2-A: I find I get more sleep, if I'm honest, than I did [when I used formula]...Even though he's woken up more, if he's having a night where he wants to nurse a lot I'll put him in bed with me and I'll just sleep and he just latches on when he wants to and it doesn't really interrupt my sleep a great deal. Whereas the other [older] two, when you're bottle feeding them you've got to kind of sit up with them, hold a bottle in their mouth, so you have to be up and you have to be awake.

Discussion

Two narratives emerged among the mothers who participated in our focus groups: the first was that of breastfeeding mothers, who prioritized flexible, cue-based care and relied on infant proximity at night to maximise maternal and infant sleep; the second was that of formula-feeding mothers, who prioritized routine-based care to enable an early return to pre-baby ways of life and sleep training methods to promote night-time maternal and infant sleep. These groups differed in terms of the balance struck between competing maternal and infant needs, as well as societal and biological imperatives. Differences in strategy and approach were the outcome of embracing different views of the sleep/feeding connection and implied different coping mechanisms to deal with trade-offs in infant and self-care.

Breastfeeding mothers reported a “proximal” form of care (St James-Roberts et al., 2006) which, according to Douglas and Hill, “promotes neuroendocrine and neurobehavioural synchronies, including of feeding and sleep, between mother and infant” (2013: p498). As in other research, breastfeeding participants reported that flexible practices of infant care enabled them to get more sleep (Doering & Durfor, 2011). We found among the formula-feeding participants that personal behavioural choices were guided by authoritative cultural norms (Chianese, Ploof, Trovato, & Chang, 2009). Currently, most interventions for infant sleep emphasize the negative effects that altered sleep patterns may have on parents and infants and focus on increasing sleep duration (Douglas & Hill, 2013). The language used, focused as it is on sleep disruption and deprivation, creates a negative association between infancy and parental sleep (Rosen, 2008). The dominant social expectation among parents, family members and health professionals is that the infant should sleep through the night alone from an early stage (Ball, 2003; Galbally, Lewis, McEgan, Scalzo, & Islam, 2013). In this study, mothers who were breastfeeding reported receiving repeated suggestions that they change their feeding method because of a perceived inadequacy in their infant’s sleep, which they countered with the ‘infant-led sleep’ narrative described above.

As in previous research (Rosen, 2008), we found that breastfeeding mothers were more likely to be comfortable with night-waking and to embrace bed-sharing as a method to protect maternal sleep. They articulated a narrative of infant sleep in which frequent waking is normal for both babies and mothers, used bed-sharing to maximise maternal sleep time and facilitate shorter awakenings, and prioritised infant sleep patterns over those of adult care-givers during the first months postpartum. The association of parent-infant bed-sharing with SIDS renders this behaviour controversial in some countries, though national recommendations regarding bed-

sharing diverge. Current UK guidance (National Institute for Health and Care Excellence, 2014) made on the basis of a stringent systematic review, found insufficient evidence to consider bed-sharing an independent risk in the absence of other factors and recommends health professionals empower parents to make informed choices about bed-sharing. In contrast, the American Academy of Pediatrics and the US National Institute of Child Health and Human Development policy statements advise that bed-sharing increases SIDS-risk and warn against bed-sharing (Moon et al., 2011; National Institute of Child Health and Human Development, 2014), although the US Academy of Breastfeeding Medicine challenges their position (Bartick & Smith, 2014; McCoy et al., 2008).

The literature on postpartum depression suggests that management of parental expectations prior to birth may prevent frustration and unfulfilled expectations of parental ability and self-efficacy (Ball, 2003; Kennedy et al., 2007). Unrealistic expectations of infant and parental sleep are associated both with higher levels of self-reported fatigue (Giallo, Rose, & Vittorino, 2011) and with negative cognition linked to depression (Muscat, Thorpe, & Obst, 2012). The emergence of a new narrative around infant sleep in the context of an increased premium on exclusive breastfeeding may reflect the efforts of breastfeeding mothers to consolidate the validity of their own experiences and re-align the expectations of prospective new parents with a “new reality” of night-time infant care.

Study Limitations

Limitations of the study are as follows. We were chiefly interested in the views of mothers, who are most often the primary night-time care-givers (Burgard, 2011) and so the perspectives of other adults contributing to decision-making about infant sleep are not included. Six of the focus groups were composed of members from pre-existing groups, who may have

previously discussed factors influencing infant sleep. While this could have shaped their understanding of infant sleep, the mothers we spoke to universally grounded their comments on sleep with reference to their experiences with their own infant and the credibility of the findings is bolstered by the close similarity of perspectives found across multiple groups located in different parts of the country.

Conclusion

In this study of mothers in the UK, we found a divergence of perceptions and narratives of infant sleep and feeding underlying the use of different strategies for night-time sleep among mother-infant pairs. We therefore contribute to the literature by confirming that infant feeding method and sleeping patterns are strongly connected in popular perception, and by identifying a new narrative influencing infant feeding and sleeping practices of mothers in the UK, with breastfeeding mothers challenging the accepted link between infant sleep and feeding. Formula feeding mothers valued a “societally normative” approach that prioritised a return to their pre-baby ways of sleep and day-to-day practices. This narrative aligns with the view of sleep and feeding that has been predominant in the UK for several decades. In contrast, breastfeeding mothers valued a “biologically natural” approach, taking cues from the infant’s biological needs for food, contact, warmth and so on. The discourse among these mothers shifted the emphasis from extending infant sleep and “getting back to normal” towards an understanding of breastfeeding and infant sleep as physiologically intertwined, and initiating a discourse around ways to accommodate these processes into daily life. Some participants in our groups had switched feeding method between children; unsurprisingly, these women’s views during focus group interviews aligned with their current method of feeding. Perceptions of feeding and sleeping are therefore fluid, context dependent and experientially-constructed. Policy and

practice implications of this study involve counselling around parental expectations of infant sleep and tailoring of expectations to reflect and support maternal feeding intentions.

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Table 1: Description of Focus Group Characteristics

Focus Group	Description of Characteristics
Primary School group—4 participants	<p>All mothers had three or more children.</p> <p>All were adult mothers over 21 years old.</p> <p>Three of four were formula feeding their current infant.</p> <p>Two who were formula feeding had previously breastfed.</p> <p>Three of four had been young mums when they had their first child.</p> <p>All were UK-born.</p> <p>All were partnered.</p>
Young Mothers group—5 participants	<p>Four were first time mothers.</p> <p>All were young mums under 21 years old.</p> <p>Four of five were formula feeding their current infant.</p> <p>The one who was breastfeeding had previously formula fed.</p> <p>All were UK-born.</p> <p>None were partnered.</p>
Breastfeeding Support group 1—7 participants	<p>Two were first time mothers.</p> <p>All were adult mothers over 21 years old.</p> <p>All were breastfeeding their current infant.</p> <p>Four had previously formula fed.</p> <p>One was a young mum when her first child was born.</p> <p>Six were UK-born.</p> <p>All were partnered.</p>
Breastfeeding Support group 2—6 participants	<p>All mothers had 2 or 3 children.</p> <p>All were adult mothers over 21 years old.</p> <p>Five were breastfeeding their current infant and one was mixed-feeding.</p> <p>Three had previously formula fed, while the one who was mixed-feeding had previously mixed fed.</p> <p>All were UK-born.</p> <p>All were partnered.</p>
Mum and Baby group 1—5 participants	<p>Two were first time mothers.</p> <p>All were adult mothers over 21 years old.</p> <p>Three were breastfeeding their current infant, one was mixed feeding and one was formula feeding, having switched from mixed feeding.</p> <p>Two were UK-born.</p> <p>All were partnered.</p>
Mum and Baby group 2—4 participants	<p>All were first time mothers.</p> <p>All were adult mothers over 21 years old.</p> <p>Three of four were breastfeeding their current infant, one was formula feeding.</p> <p>All were non-UK born.</p> <p>All were partnered.</p>
Mum and Baby group 3—8 participants	<p>Five were first time mothers.</p> <p>All were adult mothers over 21 years old.</p>

	Four of eight were breastfeeding, four were mixed feeding. Two were UK-born. All were partnered.
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